

State of Illinois  
Illinois Department of Transportation  
Division of Highways  
Bureau of Materials and Physical Research

POLICY MEMORANDUM

February 15, 2003

Springfield, Illinois

03-03

TO: DISTRICT ENGINEERS AND HIGHWAY BUREAU CHIEFS

SUBJECT: SLAG PRODUCER SELF-TESTING PROGRAM

**1.0 SCOPE**

The slag aggregate producer is responsible for processing raw slag into aggregate complying with applicable quality and gradation specifications. Consistent application of quality control (QC) over specific gravity/absorption is required to achieve quality air-cooled blast furnace (ACBF) and steel slag aggregate for use in Portland cement concrete (PCC) and hot-mix asphalt (HMA) mixtures, where allowed.

**2.0 PURPOSE**

The purpose of this policy is to establish a quality control procedure to control specific gravity/absorption on ACBF and steel slag prior to shipment to Illinois Department of Transportation (IDOT) contracts for use in PCC or HMA mixtures.

**3.0 SAMPLING/TESTING PERSONNEL**

All sampling and testing shall be conducted by an Aggregate Technician or Mixture Aggregate Technician, as designated in the IDOT "Aggregate Gradation Control System", who has had additional instruction by the Bureau of Materials and Physical Research (BMPR) in the test methods used.

The overall program shall be administered by a Quality Control (QC) Manager, as designated in the IDOT "Aggregate Gradation Control System".

**4.0 GENERAL PROCEDURE**

All ACBF and steel slag aggregate sources shall run the required tests at the specified frequency listed in this policy memorandum.

These results shall be reported within 24 hours of the completion of the test to the appropriate District Materials Engineer and to all contractors using the slag just tested. The test results shall be retained in a file at the source for 3 years. Charting of test data is recommended.

All slag sources shall submit a stockpile Quality Control Plan to the District Materials Engineer for approval prior to any production. The QC Plan shall detail all procedures the source shall conduct to assure all slag aggregate in IDOT-approved stockpiles conforms to the specific gravity/absorption requirements of this program prior to shipment.


Any slag source running this QC procedure certifies that all slag shipped for use in PCC and HMA mixtures on IDOT contracts and local agency contracts meets the specific gravity/absorption test limits and ranges cited in this policy memorandum prior to shipment.

Non-compliance with the "Slag Producer Self-Testing Program" shall result in the slag source's removal from the current IDOT "Approved Aggregate Source List".

All slag aggregate data (specific gravity absorption, etc.) for any mix design shall be obtained from the appropriate District Materials Engineer.

## 5.0 TEST METHODS / SAMPLE FREQUENCY

The following slag characteristics shall be tested by the listed test method at the required test frequency.


<b>Slag Characteristic</b>	<b>Test Method *</b>	<b>Test Frequency (minimum)</b>
Specific Gravity / Absorption Fine Aggregate: Coarse Aggregate:	AASHTO T 84 (Illinois Modified) AASHTO T 85 (Illinois Modified) 	1 per 2,000 tons 1 per 2,000 tons

## 6.0 SPECIFIC GRAVITY/ABSORPTION TEST LIMITS / RANGES

The following specific gravity/absorption test limits and ranges shall be applied to slag tested under this policy memorandum. All slag shipped per this policy memorandum shall meet these test limits and ranges prior to shipment.

<b>Individual Test Limits</b>	
Specific Gravity	± 0.050 from the approved production target** specific gravity per product/production point
Absorption	<ul style="list-style-type: none"> <li>Maximum 5.0% per product/production point</li> <li>± 1.0 from the approved production target** absorption per product/production point</li> </ul>
<b>Moving Target Test Range</b>	
Specific Gravity (the running average <sup>§</sup> of the last four specific gravity test results)	± 0.040 from the approved production target** specific gravity per product/production point

\* IDOT *Manual of Test Procedures for Materials*

 This test method is further modified to require that all test samples be washed, dried, and weighed (for Original Weight) prior to testing using AASHTO T 11 (Illinois Modified).

\*\* The production targets for both specific gravity and absorption shall be developed by averaging the first four test results at the start of production. If requested by the slag source, historical data for the characteristic may be used to establish the average. All averages shall be approved by the department prior to shipment. A source may request a target change at any time pursuant to departmental approval. Slag aggregate produced after a target change shall be stockpiled separately. Any change in the target may require a new mix design to be run.

§ The running average for specific gravity shall be calculated using the method noted in Section 9.3.1 of IDOT's QC/QA document "Aggregate Producer Control Chart Procedure" in the IDOT *Manual of Test Procedures for Materials*.

## 7.0 IDOT MONITORING

The Aggregate Inspector shall witness the sampling and splitting of one of the slag producer's samples a minimum of every 20 production days. The Aggregate Inspector shall obtain one of the two final split portions for IDOT testing. All specific gravity/absorption testing run by the slag producer shall also be conducted by IDOT on its split portion for test results comparison.

Comparison of the sample splits will be considered acceptable if the slag producer's test result falls within the following limits of the IDOT test result.

	<b><i>Fine Aggregate</i></b>	<b><i>Coarse Aggregate</i></b>
Specific Gravity	0.066	0.038
Absorption	0.66	0.41

Any specific gravity/absorption result not comparing within the above limits shall be cause for an IDOT investigation. Corrective action by the slag producer may be required at the discretion of IDOT. Continued lack of comparison may be cause for removal of the slag source from this program.

Eric E. Harm, P.E.  
Engineer of Materials  
and Physical Research

This policy memorandum supersedes Policy Memorandum 99-8 dated August 15, 1999.

SAB/dsg